Cooley Spruce Gall Adelgid

Conspicuous galls on spruce

Name and Description—*Adelges cooleyi* (Gillette) [Homoptera: Adelgidae]
Adelges cooleyi are aphid-like insects whose activity causes conspicuous galls on spruce trees and premature needle cast of Douglas-firs.

Hosts—Blue and Engelmann spruces and Douglas-fir

Life Cycle—These adelgids have a complex, 2-year life cycle when both spruce and Douglas-fir are present.

Spruce—Immature females (with a "woolly" wax covering) overwinter beneath young branches. They mature in the spring and place large numbers of eggs near branch tips in proximity to developing buds. Eggs hatch near the time of bud break, and nymphs feed at the base of newly developing needles. Galls form as the tree's growth response to saliva that is introduced during this feeding activity (fig. 1). Adelgids grow and develop within the galls. During the summer, fully developed galls begin to dry out, and winged adelgids emerge. Most of these winged insects then leave the spruce tree in search of a suitable Douglas-fir host.

Douglas-fir—Female adelgids deposit eggs on Douglas-fir needles. Multiple generations of wingless adelgids are then produced. They appear as cottony tufts scattered among the foliage (fig. 2). In late summer, some woolly adelgids migrate to spruce trees and produce eggs. These give rise to the population that will overwinter among spruce branches. Wingless adelgids stay on Douglas-fir trees and produce offspring that will overwinter on those trees.

Figure 1. Galls formed on branch tips of spruce. *Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.Service.*

Figure 2. Wingless adelgids appear as cottony tufts on Douglas-fir. *Photo: Whitney Cranshaw, Colorado State University, Bugwood.org.*

Damage—

Spruce—Where both spruce and Douglas-fir are present, galls are formed on branch tips of spruce. Impact to spruce in general forest settings is usually minimal. However, gall formation on spruce does cause the death of the branch tip, and, with extremely heavy infestations, some crown deformity may result. Galls range from 1/2-3 inches (13-75 mm) long, and nymphs can be found within them when they are green. By late summer, galls dry and turn brown. They may persist for several years. Galls are often mistaken for cones. Many spruce trees express resistance to gall formation. For trees that are not resistant, gall formation is often concentrated on well-shaded sides (north and east) of the crown.

Douglas-fir—Nymphs pierce needles and feed on fluids. Needles then become discolored, often distorted, and drop from the tree prematurely. Also, as insects feed on needles, they secrete honeydew. Sooty mold often grows on the honeydew. Nymphs also feed on developing cones. Significant damage to cones can negatively impact seed production. Galls are not formed on Douglas-fir.

Management—Control of these insects and their resulting galls (spruce) or needle drop (Douglas-fir) is not necessary in forest settings. However, their impact may be significant to trees in nurseries, plantations, or ornamental

settings. Old galls can be removed from ornamental spruce trees to improve aesthetics, but this does not influence existing or future adelgid populations. For ornamental trees, control efforts must occur before gall formation, typically as early as April. Several insecticides are registered for use to control adelgids and vary somewhat, depending upon host tree species (spruce or Douglas-fir).

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1. Cranshaw, W.S. 2005. Cooley spruce galls. Pest Fact Sheet No. 5.534. Fort Collins, CO: Colorado State University, Cooperative Extension. 3 p.

2. Cranshaw, W.S.; Leatherman, D.A.; Jacobi, W.R.; Mannix L. 2000. Insects and diseases of woody plants of the central Rockies. Bulletin 506A. Fort Collins, CO: Colorado State University, Cooperative Extension. 284 p.

3. Furniss, R.L.; Carolin, V.M. 1977. Western forest insects. Misc. Publ. 1339. Washington, DC: U.S. Department of Agriculture, Forest Service. 654 p.